

REMARKS

The examiner is thanked for the Official Action mailed November 19, 2007. This Amendment and Request for Reconsideration is intended to be fully responsive thereto.

The drawings were objected to because Figure 1 included reference numeral "97" not mentioned in the specification. Applicant has amended Figure 1 to delete reference numeral "97". No new matter has been entered.

Claims 16-18 were objected to because these claims do not definitely recite the manifold in accordance with the description and drawings which show two details. Applicant has amended these claims to correct this ambiguity. No new matter has been entered.

Claims 1 and 2 were rejected under 35 U.S.C. §102(b) as being anticipated by Capriz et al. (USP 6,661,658). Claims 6-8, 10, 19 and 22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Capriz et al. '658. Claim 3 was rejected under 35 U.S.C. §103(a) as being unpatentable over Capriz et al. '658 in view of Fukazu et al. (USP 6,648,062). Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Capriz et al. '658 in view of Pfeifer et al. (USP 7,068,507). Claim 9, 12, 15-17 and 23 was rejected under 35 U.S.C. §103(a) as being unpatentable over Capriz et al. '658 in view of Strahle et al. (USP 6,662,859). Claim 11 and 21 was rejected under 35 U.S.C. §103(a) as being unpatentable over Capriz et al. '658 in view of Miller (USP 2,821,014). Claim 13-14 was rejected under 35 U.S.C. §103(a) as being unpatentable over Capriz et al. '658 in view of Strahle et al. '859 and Miller '014. Claim 18 and 20 was rejected under 35 U.S.C. §103(a) as being unpatentable over Capriz et al. '658 in view of Strahle '859, Fukazu et al. '062 and Pfeifer et al. (USP 7,068,507). These rejections are respectfully traversed in view of the foregoing amendments and the following comments.

The present invention provides a unique and simplified assembly whereby the metal plate 23 is formed with liquid circulation channels (28) pressed-formed into the plate 23 such that the plate 23 may be braised either directly to the support plate 21 or braised to the support plate 21 through the second plate 24. This assembly eliminates the need for separate baffles and fins which can be difficult to assemble in small spaces.

Anticipation

Regarding anticipation, claims 1 and 2 stand rejected under 35 U.S.C. §102(b) as being anticipated by Capriz et al. '658. Amended claim 1 recites *inter alia*:

... wherein the first pressed metal plate is smaller than the support plate when observed in a direction perpendicular to said plates.

The invention as recited in amended claim 1 makes it possible to cool the support plate locally, only at the area corresponding to the power electronics. The relatively small size of the first pressed metal plate enables reduction of the total weight of the device, compared to the case where both pressed plate and support plate have the same dimensions.

Capriz discloses a fluid cooled heat sink (1) comprising a thick metal plate (2) and a second plate (6) (see figure 3 and column 3, lines 4 to 22). The plates (2 and 6) are of the same size when observed in a direction perpendicular to said plates (see figures 1 and 2). Capriz does not disclose nor suggest two plates with different dimensions when observed in a direction perpendicular to said plates (see figures 1 and 2), contrary to the invention as recited in amended claim 1. Consequently, Capriz cannot and does not anticipate the present invention as recited in claim 1.

Obviousness

Regarding obviousness, claims 6-8, 10, 19 and 22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Capriz et al. '658.

Amended Claim 6

Amended claim 6 recites *inter alia*:

... wherein the device comprises at least one orifice extending through both the support plate and the pressed metal plate.

In Capriz, the metal plate (2) has no through orifice. As shown on figure 4 of Capriz, the screwing orifice in metal plate (2) extends only in a portion of the thickness thereof. Capriz does not disclose nor suggest a device comprising at least one orifice extending through both a support plate and a metal plate, contrary to the invention as recited in amended claims 6.

Amended claim 22

Amended claim 22 recites *inter alia*:

... wherein turbulators are configured in the cooling circuit in a junction of said two circulation channels.

This feature has the advantage of offering more rapid cooling of the power electronics (see page 9, lines 30 to 32 of the English translation). Capriz does not disclose nor suggest turbulators, contrary to the invention as recited in amended claims 22.

Amended claim 16

The Examiner has rejected claims 9, 12, 15-17 and 23 under 35 U.S.C. 103(a) as being unpatentable over Capriz at al. (US 6,661,658) in view of Strahle at al. US 6,662,859). Amended claim 16 recites *inter alia*:

...producing at least one orifice through the first metal plate (23) and a support plate...

This feature makes it possible to avoid carrying out expensive additional machining after brazing of the device (see page 12, lines 18 and 19 of the translation of the present patent application).

Capriz does not disclose nor suggest the step of producing at least one orifice through a first metal plate and a support plate.

Strahle discloses an evaporative heat exchanger (20) comprising a coolant flow channel (28), said channel (28) being defined between two half shells (30 and 32) (see figures 3 and 4 and column 2, lines 56 to 67), and a process for manufacturing the heat exchanger (20) (see column 6, lines 23 to 67). Strahle does not disclose nor suggest the step of producing at least one orifice through a first metal plate and a support plate.

Consequently, Capriz even in combination with Strahle cannot render obvious the invention as recited in amended claim 16.

Amended Claim 23

Amended claim 23 recites *inter alia*:

... a support plate (21) with a first side on which power electronics are mounted

... at least one manifold extending on the first side of the support plate (21)...

As the manifold and the electronics are placed on a same side of the support plate, it is possible to have a compact device, for instance compared to a device with element protruding on opposite sides of the support plate. Capriz does not disclose nor suggest a device with at least one manifold, contrary to the invention as recited in claim 23. Strahle discloses an evaporative heat exchanger (20) comprising an electronic component (64) placed on the bottom of a vessel (24) (see figure 3). The vessel is secured at the top to a support plate (26) on which coolant liquid inlet and flat connectors (44 and 46) are mounted (see figures 3, column 1, lines 59 to 61, and column 2, lines 21 and 22). The heat exchanger (20) disclosed in Strahle has a great height due to the position of the different elements. Strahle does not disclose nor suggest that at least one manifold extends on a first side of a support plate on which power electronics are mounted. Strahle does not remedy to the deficiencies of Capriz.

Thus, Capriz even in combination with Strahle cannot anticipate or render obvious the invention as recited in amended claim 23.

New claim 24

New claim 24 recites *inter alia*:

... producing turbulators in the cooling circuit ...

Since Capriz and Strahle fail to disclose turbulators as set forth in new claim 24, new claim 24 is on condition for allowance.

Applicant respectfully submits that the outstanding rejections and objections are overcome by the foregoing amendment and notice to that effect is earnestly solicited. Should the examiner believe that issues may be resolved through direct communication, the examiner is invited to contact the undersigned representative for the applicant.

No additional fees are believed due; however, please charge any fee deficiency or credit any overpayment to Deposit Account No. 50-0548 to maintain the pendency of this application.

Respectfully submitted,



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